



Development of an Ultra-Safe and Low-Emission Dedicated Alternative Fuel School Bus

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NREL Subcontract Administrator

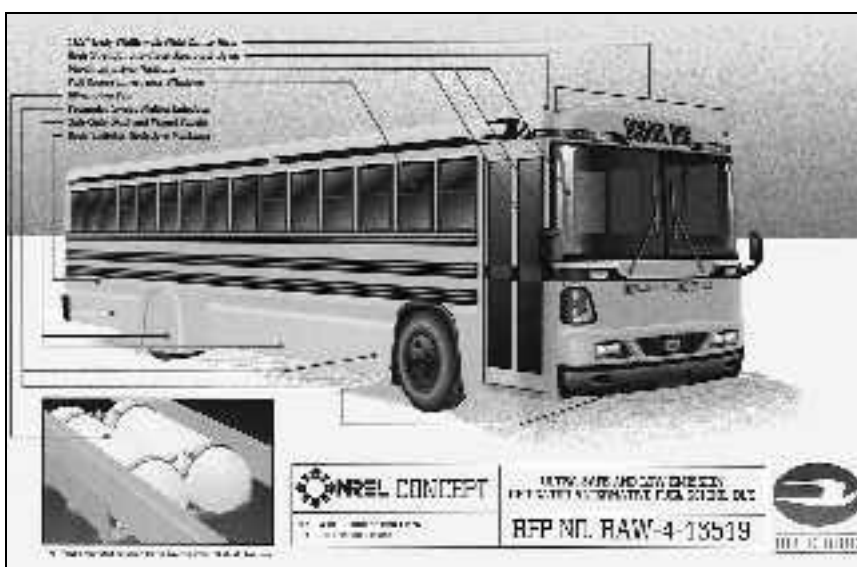
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Objective

To develop an ultra safe, ultra low emissions alternative fuel school bus with advanced safety features and good performance, efficiency, and driveability.

Approach

Blue Bird will design and build a prototype transit-style school bus that incorporates several new safety features, including increased driver visibility and a pedestrian detection system. The bus will be equipped with a new compressed natural gas (CNG) fuel storage system provided by CNG Cylinder Company, and powered by a

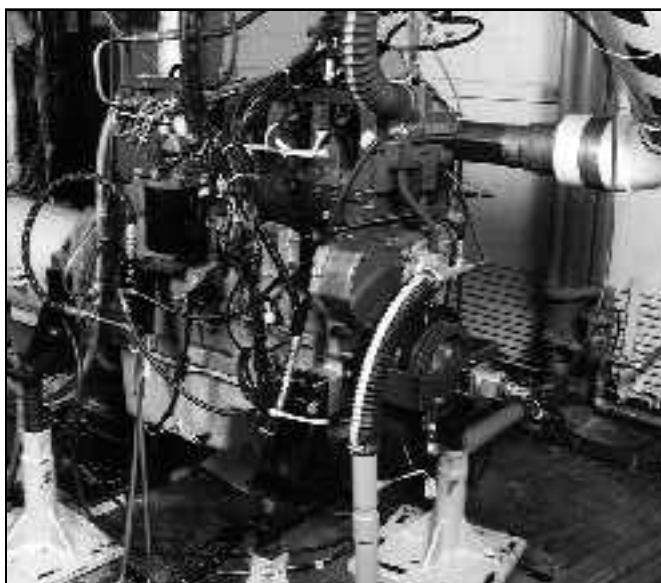


Blue Bird school bus

John Deere 6081 natural gas engine. This engine is John Deere's first on-road commercial application, and is the most advanced of its type. It will be equipped with an advanced fuel control system developed for ultra-low emissions output. After the vehicle is developed, Southwest Research Institute will integrate the fuel storage and engine systems into an operating bus. The bus will then be evaluated in a 10,000-mile field demonstration test.

Accomplishments

Blue Bird has designed the body and chassis for the new bus, and has tested the new body structure and braking system. John Deere has modified several engine components for better performance and emissions potential. A prototype 6081 engine equipped with a full authority electronic control system (manufactured by Mesa Environmental) has been installed in a test cell at Southwest Research Institute, and initial engine development work has begun.



John Deere 6081 engine (6 cylinder, 8.0 liter)

Future Direction

Work will continue on constructing the prototype vehicle. The engine and control systems, which are targeted to meet the California Air Resources Board Ultra-Low Emissions Vehicle (CARB ULEV) emissions standards, will be developed in parallel with the vehicle. Efforts will also be made to lower oxides of nitrogen (NO_x) emissions below 1 g/bhp-h. We expect to begin integrating the vehicle, engine, and fuel storage systems in December 1996. The field test demonstration will then provide an opportunity to evaluate the vehicle's driveability, fuel economy, durability, and overall safety.

Publications

Kubesh, J. 1995. "Development of an Ultra-Safe, Ultra-Low Emissions Natural Gas School Bus—Phase I: System Design Report." Southwest Research Institute. NREL/TP-425-7609. May.

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Kubesh, J.; Podner, D.; Colucci, C. 1996. "Lean Limit and Performance Improvements for a Heavy-Duty Natural Gas Engine." SAE Paper #961939. October.

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Emissions Comparison NG Engine Results vs. CARB ULEV Standards

